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Sequence Listing could not be accepted due to errors.

See attached Validation Report.

If you need help call the Patent Electronic Business Center at (866) 217-9197 (toll free).

Reviewer: Anne Corrigan

Timestamp: [year=2008; month=7; day=31; hr=19; min=0; sec=59; ms=598;]

=====

Reviewer Comments:

<210> 2

<211> 336

<212> PRT

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:

immunogenic protein of M. avium paratuberculosis

Please remove the above <220>-<223> section. This is a peptide sequence, not a combined DNA/RNA sequence; this error also appears in all subsequent amino acid sequences in the submitted file.

<210> 9

<211> 625

<212> DNA

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:

immunogenic protein of M. avium paratuberculosis

<220>

<221> CDS

<222> (179)..(625)

<223> /note="Xaa at location 95 stands for Gln or His,
at location 118 stands for Gly or Arg, at location
147 stands for stop codon, Trp or Cys"

<400> 9

aattcgcgca tacccggtcac tggtcacaac gccacatgct ggtaggctgt ggaatcgagg 60

gtcaatccgg atcggacccc aacgtcgact tgtgggcgcc aattcgcggg ttttcgccca 120

gcaagtcgac gttcggcgcg aatcggtgag gtgggcacag gtgaatgacg aagaggac 178

atg ctg gtc gcc acg gtg cgg gcg ttc atc gac cgc gag gtc aaa ccg 226
Met Leu Val Ala Thr Val Arg Ala Phe Ile Asp Arg Glu Val Lys Pro
1 5 10 15

acc gtg cgc gag gtg gag cac gcc gat gcc tat ccc gag gcg tgg atc 274
Thr Val Arg Glu Val Glu His Ala Asp Ala Tyr Pro Glu Ala Trp Ile
20 25 30

gag cag atg aag cgg atc ggg atc tac ggg ctg gcg gtg ccc gag gaa 322
Glu Gln Met Lys Arg Ile Gly Ile Tyr Gly Leu Ala Val Pro Glu Glu
35 40 45

tac ggt ggt tcg ccg gtg tcc atg ccg tgc tac gtg cgg gtc acc gag 370
Tyr Gly Gly Ser Pro Val Ser Met Pro Cys Tyr Val Arg Val Thr Glu
50 55 60

cag ctg gcg cgc ggc tgg atg agc ctg gcc ggg gcg atg ggc ggg cac 418
Gln Leu Ala Arg Gly Trp Met Ser Leu Ala Gly Ala Met Gly Gly His
65 70 75 80

acc gtg gtg gcc aag ctg cta acg ctg ttc ggc acc gag gac cas aag 466
Thr Val Val Ala Lys Leu Leu Thr Leu Phe Gly Thr Glu Asp Xaa Lys
85 90 95

cgg gcc tac ctg ccg cgg atg gcc agc ggc gaa atc cgg gcc acc atg 514
Arg Ala Tyr Leu Pro Arg Met Ala Ser Gly Glu Ile Arg Ala Thr Met
100 105 110

gcg ttg acc gag ccc sgc ggc ggc tcg gac ctg cag aac atg tcg acc 562
Ala Leu Thr Glu Pro Xaa Gly Gly Ser Asp Leu Gln Asn Met Ser Thr
115 120 125

acc gcg ctg ccc gac ccc gac tcc gac ggn ctg gtg gtc aac ggg gcc 610
Thr Ala Leu Pro Asp Pro Asp Ser Asp Xaa Leu Val Val Asn Gly Ala
130 135 140

aag acc tgn atc aac
Lys Thr Xaa Ile Asn
145

625

The above <223> response describing Xaa at location 147 is incorrect:
"Xaa" cannot represent a stop codon, only a single amino acid. Also,
the "n's" at locations 592 and 619 are not explained above.

<210> 10
<211> 149
<212> PRT
<213> Mycobacterium avium paratuberculosis

<220>
<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<220>
<221> CDS
<222> (95)..(147)
<223> /note="Xaa at location 95 stands for Gln or His,
at location 118 stands for Gly or Arg, at location
147 stands for stop codon, Trp or Cys"

Xaa cannot represent a stop codon.

<210> 15
<211> 419
<212> DNA
<213> Mycobacterium avium paratuberculosis

<220>
<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<220>
<221> CDS
<222> (25)..(417)
<223> /note="Xaa at location 103 stands for Met, Val or
Leu, Xaa at location 125 stands for Lys, Arg, Thr
or Met"

<400> 15

cggccaccgc acccagggga ggcc atg act cac acc aag gcc ggt cgt gcc 51
Met Thr His Thr Lys Ala Gly Arg Ala
1 5

gcg tgg ccg gcc gcc tgc gcg gtc gtc ctg tcc gcc gcc gcg ctg ttg 99
Ala Trp Pro Ala Ala Cys Ala Val Val Leu Ser Ala Ala Ala Leu Leu
10 15 20 25

tgc gcg gca gcg gcc gcc gcg gac gaa gcc gat gac gcg ttc ctc gcc 147
Cys Ala Ala Ala Ala Ala Ala Asp Glu Ala Asp Asp Ala Phe Leu Ala
30 35 40

ggc ctg gcc aag ggc ggg atc acc atg ttc gac gac gac gac gcg atc 195
Gly Leu Ala Lys Gly Gly Ile Thr Met Phe Asp Asp Asp Asp Ala Ile
45 50 55

gcc atg ggc cac agc gtg tgc tcg agc atc gac gcc aac ccc aac gtg 243
Ala Met Gly His Ser Val Cys Ser Ser Ile Asp Ala Asn Pro Asn Val
60 65 70

tcg atg ctg gcg ctg cgg ctg acc aag caa acc ccg ttg acg ccg aag 291
Ser Met Leu Ala Leu Arg Leu Thr Lys Gln Thr Pro Leu Thr Pro Lys
75 80 85

caa tcc ggc tac ttc atc ggt ctt tcg gtc gcc agc tac ntg ccc gca 339
Gln Ser Gly Tyr Phe Ile Gly Leu Ser Val Ala Ser Tyr Xaa Pro Ala
90 95 100 105

gta caa gga cga cgt cga ccc ctc gct ggg ctg gct gat ccc gcc gcc 387
Val Gln Gly Arg Arg Arg Pro Leu Ala Gly Leu Ala Asp Pro Ala Ala
110 115 120

gct gat gtg ang ttg ccg gcc ggc atc ggc gt 419
Ala Asp Val Xaa Leu Pro Ala Gly Ile Gly
125 130

The "n's" at locations 331 and 398 are not described above.

Application No: 10501127 Version No: 3.0

Input Set:

Output Set:

Started: 2008-07-25 21:36:44.140
Finished: 2008-07-25 21:36:47.281
Elapsed: 0 hr(s) 0 min(s) 3 sec(s) 141 ms
Total Warnings: 22
Total Errors: 4
No. of SeqIDs Defined: 22
Actual SeqID Count: 22

Error code	Error Description
W 402	Undefined organism found in <213> in SEQ ID (1)
W 402	Undefined organism found in <213> in SEQ ID (2)
W 402	Undefined organism found in <213> in SEQ ID (3)
W 402	Undefined organism found in <213> in SEQ ID (4)
W 402	Undefined organism found in <213> in SEQ ID (5)
W 402	Undefined organism found in <213> in SEQ ID (6)
W 402	Undefined organism found in <213> in SEQ ID (7)
W 402	Undefined organism found in <213> in SEQ ID (8)
W 402	Undefined organism found in <213> in SEQ ID (9)
E 342	'n' position not defined found at POS: 592 SEQID(9)
E 342	'n' position not defined found at POS: 619 SEQID(9)
W 402	Undefined organism found in <213> in SEQ ID (10)
W 402	Undefined organism found in <213> in SEQ ID (11)
W 402	Undefined organism found in <213> in SEQ ID (12)
W 402	Undefined organism found in <213> in SEQ ID (13)
W 402	Undefined organism found in <213> in SEQ ID (14)
W 402	Undefined organism found in <213> in SEQ ID (15)
E 342	'n' position not defined found at POS: 331 SEQID(15)
E 342	'n' position not defined found at POS: 398 SEQID(15)
W 402	Undefined organism found in <213> in SEQ ID (16)

Input Set:

Output Set:

Started: 2008-07-25 21:36:44.140
Finished: 2008-07-25 21:36:47.281
Elapsed: 0 hr(s) 0 min(s) 3 sec(s) 141 ms
Total Warnings: 22
Total Errors: 4
No. of SeqIDs Defined: 22
Actual SeqID Count: 22

Error code	Error Description
W 402	Undefined organism found in <213> in SEQ ID (17)
W 402	Undefined organism found in <213> in SEQ ID (18)
W 402	Undefined organism found in <213> in SEQ ID (19)
W 402	Undefined organism found in <213> in SEQ ID (20) This error has occurred more than 20 times, will not be displayed

SEQUENCE LISTING

<110> ID-Lelystad, Instituut voor Dierhouderij en Diergezondheid B.V.
 Willemsen, Petrus T.J.
 Westerveen, Sjoukje F.
 Bakker, Douwe
 Zijderveld van, Fred G.
 Thole, Jelle E.R.

<120> Paramycobacterial diagnostics and vaccines

<130> P54977PC00

<140> 10501127

<141> 2004-09-10

<150> PCT/NL03/00020

<151> 2003-01-13

<150> EP 02075089.9

<151> 2002-01-11

<160> 22

<170> PatentIn Ver. 2.1

<210> 1

<211> 1175

<212> DNA

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:
 immunogenic protein of M. avium paratuberculosis

<220>

<221> CDS

<222> (134)..(1144)

<400> 1

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tgtgtgtgat tcttgccaga cagcatcggc ggggcgcgcc gacacaacac atagtcagat 120

agaggagact tcc gtg ccg aac cga cgc cga cgc aag ctt tcg aca gcc 169

Val Pro Asn Arg Arg Arg Arg Lys Leu Ser Thr Ala

1

5

10

atg agc gcg gtc gcc gcc ctg gca gtg gcg agt cct tgc gca tac ttc 217

Met Ser Ala Val Ala Ala Leu Ala Val Ala Ser Pro Cys Ala Tyr Phe

15

20

25

ctt gtc tac gaa tcg acg gcc ggc aac aag gcg ccc gag cac cac gag 265

Leu Val Tyr Glu Ser Thr Ala Gly Asn Lys Ala Pro Glu His His Glu

30

35

40

ttc aag cag gcc gca gtg atg agc gat ctg ccg ggc gag ctg atg ggt 313

Phe	Lys	Gln	Ala	Ala	Val	Met	Ser	Asp	Leu	Pro	Gly	Glu	Leu	Met	Gly	
45					50					55					60	
gcg	ctg	tcg	cag	ggc	ctg	tcg	cag	ttt	ggg	atc	aac	ctg	ccc	ccg	gtg	361
Ala	Leu	Ser	Gln	Gly	Leu	Ser	Gln	Phe	Gly	Ile	Asn	Leu	Pro	Pro	Val	
				65					70					75		
ccc	gcc	ctg	agc	ggc	ggc	gcc	acc	agc	act	ccc	ggg	ctg	gcc	agc	ccc	409
Pro	Ala	Leu	Ser	Gly	Gly	Ala	Thr	Ser	Thr	Pro	Gly	Leu	Ala	Ser	Pro	
			80					85					90			
ggc	ctg	ggg	agc	ccc	ggc	ctg	ggc	acg	ccc	ggc	ctg	gga	acg	ccg	ggc	457
Gly	Leu	Gly	Ser	Pro	Gly	Leu	Gly	Thr	Pro	Gly	Leu	Gly	Thr	Pro	Gly	
	95						100					105				
ctg	acc	aat	ccc	ggg	ctg	acg	agc	ccc	ggg	gcg	acc	agt	ccc	ggc	ctg	505
Leu	Thr	Asn	Pro	Gly	Leu	Thr	Ser	Pro	Gly	Ala	Thr	Ser	Pro	Gly	Leu	
	110					115					120					
acc	agt	ccc	ggc	ctg	acc	agt	cct	ggg	ttg	acc	agc	ccc	ggg	ctg	acc	553
Thr	Ser	Pro	Gly	Leu	Thr	Ser	Pro	Gly	Leu	Thr	Ser	Pro	Gly	Leu	Thr	
125					130					135				140		
agc	ccg	ggg	gcg	gcg	ccg	acg	acg	ccc	ggg	ctc	acc	gcg	ccc	ggc	gcg	601
Ser	Pro	Gly	Ala	Ala	Pro	Thr	Thr	Pro	Gly	Leu	Thr	Ala	Pro	Gly	Ala	
			145					150					155			
ctg	ccg	acc	acg	ccg	ggc	ggc	ggg	gtc	gcc	acc	ccc	ggc	gcc	ggg	ctc	649
Leu	Pro	Thr	Thr	Pro	Gly	Gly	Gly	Val	Ala	Thr	Pro	Gly	Ala	Gly	Leu	
			160					165					170			
aac	ccc	gcg	ctg	tcc	aac	ccc	ggg	ctg	acc	agc	ccg	gcc	ggg	acg	gcg	697
Asn	Pro	Ala	Leu	Ser	Asn	Pro	Gly	Leu	Thr	Ser	Pro	Ala	Gly	Thr	Ala	
	175						180					185				
ccg	ggg	ctg	ggc	agc	ccg	acc	gtg	gcg	ccg	agt	gag	gtg	ccg	atc	gac	745
Pro	Gly	Leu	Gly	Ser	Pro	Thr	Val	Ala	Pro	Ser	Glu	Val	Pro	Ile	Asp	
	190					195					200					
tcc	ggg	gcc	ggc	ctg	gac	ccg	ggc	gcc	ggg	ggc	acg	tac	ccg	atc	ctg	793
Ser	Gly	Ala	Gly	Leu	Asp	Pro	Gly	Ala	Gly	Gly	Thr	Tyr	Pro	Ile	Leu	
205					210					215				220		
ggc	gac	ccg	tcg	acc	ttc	ggg	aac	gcc	tcg	ccg	atc	ggc	ggc	ggg	ggc	841
Gly	Asp	Pro	Ser	Thr	Phe	Gly	Asn	Ala	Ser	Pro	Ile	Gly	Gly	Gly	Gly	
				225					230					235		
acc	ggg	ctg	ggc	ggc	ggc	tcg	agc	tcg	ggg	ggc	agc	ggc	ggc	ctg	gtc	889
Thr	Gly	Leu	Gly	Gly	Gly	Ser	Ser	Ser	Gly	Gly	Ser	Gly	Gly	Leu	Val	
			240					245					250			
aac	gac	gtg	atg	caa	gcc	gcc	aac	cag	ctc	ggc	gcg	ggg	cag	gcg	atc	937
Asn	Asp	Val	Met	Gln	Ala	Ala	Asn	Gln	Leu	Gly	Ala	Gly	Gln	Ala	Ile	
	255						260					265				
gac	ctg	ctc	aag	ggc	ctg	gtg	atg	ccg	gcg	atc	acg	cag	ggc	atg	cac	985
Asp	Leu	Leu	Lys	Gly	Leu	Val	Met	Pro	Ala	Ile	Thr	Gln	Gly	Met	His	

270	275	280	
ggc ggc gcg gcc gcg ggt gct ttg ccc ggc gcg gcc ggt gct ctg ccc			1033
Gly Gly Ala Ala Ala Gly Ala Leu Pro Gly Ala Ala Gly Ala Leu Pro			
285	290	295	300
ggc gcg gcc ggc gcc ctg ccc ggt gcg gcc ggc gcc ctg ccg ggt gcg			1081
Gly Ala Ala Gly Ala Leu Pro Gly Ala Ala Gly Ala Leu Pro Gly Ala			
305	310	315	
gcg ggc gcc gcg ggt gcg ttg ccg gcg gcc gcc ggc gcc gcg ccg gca			1129
Ala Gly Ala Ala Gly Ala Leu Pro Ala Ala Ala Gly Ala Ala Pro Ala			
320	325	330	
ctg ccc ccg gtc tag accttttcca aaccatccac cagacggcac c			1175
Leu Pro Pro Val			
335			

<210> 2

<211> 336

<212> PRT

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<400> 2

Val Pro Asn Arg Arg Arg Arg Lys Leu Ser Thr Ala Met Ser Ala Val			
1	5	10	15
Ala Ala Leu Ala Val Ala Ser Pro Cys Ala Tyr Phe Leu Val Tyr Glu			
20	25	30	
Ser Thr Ala Gly Asn Lys Ala Pro Glu His His Glu Phe Lys Gln Ala			
35	40	45	
Ala Val Met Ser Asp Leu Pro Gly Glu Leu Met Gly Ala Leu Ser Gln			
50	55	60	
Gly Leu Ser Gln Phe Gly Ile Asn Leu Pro Pro Val Pro Ala Leu Ser			
65	70	75	80
Gly Gly Ala Thr Ser Thr Pro Gly Leu Ala Ser Pro Gly Leu Gly Ser			
85	90	95	
Pro Gly Leu Gly Thr Pro Gly Leu Gly Thr Pro Gly Leu Thr Asn Pro			
100	105	110	
Gly Leu Thr Ser Pro Gly Ala Thr Ser Pro Gly Leu Thr Ser Pro Gly			
115	120	125	
Leu Thr Ser Pro Gly Leu Thr Ser Pro Gly Leu Thr Ser Pro Gly Ala			
130	135	140	
Ala Pro Thr Thr Pro Gly Leu Thr Ala Pro Gly Ala Leu Pro Thr Thr			
145	150	155	160
Pro Gly Gly Gly Val Ala Thr Pro Gly Ala Gly Leu Asn Pro Ala Leu			
165	170	175	
Ser Asn Pro Gly Leu Thr Ser Pro Ala Gly Thr Ala Pro Gly Leu Gly			
180	185	190	
Ser Pro Thr Val Ala Pro Ser Glu Val Pro Ile Asp Ser Gly Ala Gly			
195	200	205	
Leu Asp Pro Gly Ala Gly Gly Thr Tyr Pro Ile Leu Gly Asp Pro Ser			
210	215	220	

Thr	Phe	Gly	Asn	Ala	Ser	Pro	Ile	Gly	Gly	Gly	Gly	Thr	Gly	Leu	Gly
225					230				235					240	
Gly	Gly	Ser	Ser	Ser	Gly	Gly	Ser	Gly	Gly	Leu	Val	Asn	Asp	Val	Met
				245					250					255	
Gln	Ala	Ala	Asn	Gln	Leu	Gly	Ala	Gly	Gln	Ala	Ile	Asp	Leu	Leu	Lys
			260					265				270			
Gly	Leu	Val	Met	Pro	Ala	Ile	Thr	Gln	Gly	Met	His	Gly	Gly	Ala	Ala
		275					280					285			
Ala	Gly	Ala	Leu	Pro	Gly	Ala	Ala	Gly	Ala	Leu	Pro	Gly	Ala	Ala	Gly
	290					295				300					
Ala	Leu	Pro	Gly	Ala	Ala	Gly	Ala	Leu	Pro	Gly	Ala	Ala	Gly	Ala	Ala
305					310				315					320	
Gly	Ala	Leu	Pro	Ala	Ala	Ala	Gly	Ala	Ala	Pro	Ala	Leu	Pro	Pro	Val
			325					330					335		

<210> 3

<211> 600

<212> DNA

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<220>

<221> CDS

<222> (67)..(567)

<400> 3

ttcgagaagg gatagcaggc ggggccgggc ggtgaaccgc ggaggcgcgc ggtgcgtctt 60

cagggc	atg	tcc	cgt	ttg	tca	ttt	gtc	tgc	agg	ctt	ttg	gcc	gca	acc	108
	Met	Ser	Arg	Leu	Ser	Phe	Val	Cys	Arg	Leu	Leu	Ala	Ala	Thr	
	1			5								10			

gct	ttc	gcc	gtc	gcc	ctg	cta	ctc	ggg	ctg	ggc	gac	gtg	ccg	cgc	gcg	156
Ala	Phe	Ala	Val	Ala	Leu	Leu	Leu	Gly	Leu	Gly	Asp	Val	Pro	Arg	Ala	
15				20					25					30		

gcg	gcc	acc	gac	gac	cgc	ctg	caa	ttc	acc	gcg	acc	acg	ctc	agc	ggc	204
Ala	Ala	Thr	Asp	Asp	Arg	Leu	Gln	Phe	Thr	Ala	Thr	Thr	Leu	Ser	Gly	
			35					40					45			

gcg	ccg	ttc	aac	ggc	gcc	agt	ctg	cag	ggc	aag	ccc	gcc	gtg	ctg	tgg	252
Ala	Pro	Phe	Asn	Gly	Ala	Ser	Leu	Gln	Gly	Lys	Pro	Ala	Val	Leu	Trp	
		50						55				60				

ttc	tgg	acg	ccg	tgg	tgc	ccg	tac	tgc	aac	gcc	gag	gcc	ccg	ggc	gtg	300
Phe	Trp	Thr	Pro	Trp	Cys	Pro	Tyr	Cys	Asn	Ala	Glu	Ala	Pro	Gly	Val	
	65					70						75				

agc	ccg	gtg	gcc	gcc	gcc	aac	ccg	ggc	gtc	acc	ttc	gtc	ggc	gtc	gcc	348
Ser	Arg	Val	Ala	Ala	Ala	Asn	Pro	Gly	Val	Thr	Phe	Val	Gly	Val	Ala	
	80					85						90				

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gcc cac tcc gaa gtc ggc gcc atg gcc aac ttc gtc tcc aag tac aac 396
Ala His Ser Glu Val Gly Ala Met Ala Asn Phe Val Ser Lys Tyr Asn
 95          100          105          110

ctg aac ttc acc acg ctc aac gac gcc gac ggc gcg atc tgg gcc cgc 444
Leu Asn Phe Thr Thr Leu Asn Asp Ala Asp Gly Ala Ile Trp Ala Arg
 115          120          125

tac ggc gtg ccc tgg cag ccc gcg tac gtg ttc tac cgg gcg gac ggc 492
Tyr Gly Val Pro Trp Gln Pro Ala Tyr Val Phe Tyr Arg Ala Asp Gly
 130          135          140

agc tcc acc ttc gtc aac aac ccc acc tcg gcg atg ccc cag gac gaa 540
Ser Ser Thr Phe Val Asn Asn Pro Thr Ser Ala Met Pro Gln Asp Glu
 145          150          155

ctg gcc gcc cgg gtg gcg gcg ctg cgc tgacgtggac cgcggtctgg 587
Leu Ala Ala Arg Val Ala Ala Leu Arg
 160          165

tcgggctggc ggt 600

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<210> 4

<211> 167

<212> PRT

<213> *Mycobacterium avium paratuberculosis*

<220>

<223> Description of Combined DNA/RNA Molecule:

immunogenic protein of *M. avium paratuberculosis*

<400> 4

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Met Ser Arg Leu Ser Phe Val Cys Arg Leu Leu Ala Ala Thr Ala Phe
 1          5          10          15

Ala Val Ala Leu Leu Leu Gly Leu Gly Asp Val Pro Arg Ala Ala Ala
 20          25          30

Thr Asp Asp Arg Leu Gln Phe Thr Ala Thr Thr Leu Ser Gly Ala Pro
 35          40          45

Phe Asn Gly Ala Ser Leu Gln Gly Lys Pro Ala Val Leu Trp Phe Trp
 50          55          60

Thr Pro Trp Cys Pro Tyr Cys Asn Ala Glu Ala Pro Gly Val Ser Arg
 65          70          75          80

Val Ala Ala Ala Asn Pro Gly Val Thr Phe Val Gly Val Ala Ala His
 85          90          95

Ser Glu Val Gly Ala Met Ala Asn Phe Val Ser Lys Tyr Asn Leu Asn
 100          105          110

Phe Thr Thr Leu Asn Asp Ala Asp Gly Ala Ile Trp Ala Arg Tyr Gly
 115          120          125

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Val Pro Trp Gln Pro Ala Tyr Val Phe Tyr Arg Ala Asp Gly Ser Ser
130 135 140

Thr Phe Val Asn Asn Pro Thr Ser Ala Met Pro Gln Asp Glu Leu Ala
145 150 155 160

Ala Arg Val Ala Ala Leu Arg
165

<210> 5

<211> 366

<212> DNA

<213> Mycobacterium avium paratuberculosis

<220>

<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<220>

<221> CDS

<222> (34)..(366)

<400> 5

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Met Arg Leu Ser Leu Ser Lys
1 5

ttg ggc gtt gcg gtg ggc agc gcg gca gtg gca ttg acc gcc gcg gcc 102
Leu Gly Val Ala Val Gly Ser Ala Ala Val Ala Leu Thr Ala Ala Ala
10 15 20

ggt gtc gca tcc gcc gac ccc atg gac gcg atc atc aac acc acc tgc 150
Gly Val Ala Ser Ala Asp Pro Met Asp Ala Ile Ile Asn Thr Thr Cys
25 30 35

aac tac ggg cag gtg atc gcc gcg ctg aac gcg tcc gac ccg gcg gct 198
Asn Tyr Gly Gln Val Ile Ala Ala Leu Asn Ala Ser Asp Pro Ala Ala
40 45 50 55

gcc cag cag ctg aac tcg tcg ccg atg gcg cag tcc tac atc cag cgg 246
Ala Gln Gln Leu Asn Ser Ser Pro Met Ala Gln Ser Tyr Ile Gln Arg
60 65 70

ttc ctg gcc tcc ccg ccg gcg aag cgt cag cag atg gcc cag cag atc 294
Phe Leu Ala Ser Pro Pro Ala Lys Arg Gln Gln Met Ala Gln Gln Ile
75 80 85

cag ggc atg ccg gcc gcg cag cag tac atc aac gac atc aac cag gtc 342
Gln Gly Met Pro Ala Ala Gln Gln Tyr Ile Asn Asp Ile Asn Gln Val
90 95 100

gcg gtc acc tgt aac aac ttc tga 366
Ala Val Thr Cys Asn Asn Phe
105 110

<210> 6
<211> 110
<212> PRT
<213> Mycobacterium avium paratuberculosis

<220>
<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<400> 6
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1 5 10 15
Val Ala Leu Thr Ala Ala Ala Gly Val Ala Ser Ala Asp Pro Met Asp
20 25 30
Ala Ile Ile Asn Thr Thr Cys Asn Tyr Gly Gln Val Ile Ala Ala Leu
35 40 45
Asn Ala Ser Asp Pro Ala Ala Ala Gln Gln Leu Asn Ser Ser Pro Met
50 55 60
Ala Gln Ser Tyr Ile Gln Arg Phe Leu Ala Ser Pro Pro Ala Lys Arg
65 70 75 80
Gln Gln Met Ala Gln Gln Ile Gln Gly Met Pro Ala Ala Gln Gln Tyr
85 90 95
Ile Asn Asp Ile Asn Gln Val Ala Val Thr Cys Asn Asn Phe
100 105 110

<210> 7
<211> 1410
<212> DNA
<213> Mycobacterium avium paratuberculosis

<220>
<223> Description of Combined DNA/RNA Molecule:
immunogenic protein of M. avium paratuberculosis

<220>
<221> CDS
<222> (46)..(1410)

<400> 7
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Val Ala Pro Lys
1

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Val Ser Ser Asp Leu Phe Ser Gln Ile Val Asn Ser Gly Pro Gly Ser
5 10 15 20

ttt ctc gcc aag cag ctc ggc gtc ccg caa ccc gag acg ctg cgc cgc 153
Phe Leu Ala Lys Gln Leu Gly Val Pro Gln Pro Glu Thr Leu Arg Arg
25 30 35

tac cgg ccc ggt gac ccg ccg ctg gcc ggg tcg ctg ctg atc ggc ggc 201
Tyr Arg Pro Gly Asp Pro Pro Leu Ala Gly Ser Leu Leu Ile Gly Gly
40 45 50

gag ggc cgc gtg gtc gag ccg ctg cgg gcg gcg ctg gcc aag gac tac	249
Glu Gly Arg Val Val Glu Pro Leu Arg Ala Ala Leu Ala Lys Asp Tyr	
55 60 65	
gac ctg gtc ggc aac aac ctg ggc ggg cgc tgg gcc gac cgg ttc ggc	297
Asp Leu Val Gly Asn Asn Leu Gly Gly Arg Trp Ala Asp Arg Phe Gly	
70 75 80	
ggg ctg gtc ttc gac gcc acc ggg atc acc acc ccg gag ggc ctg aag	345
Gly Leu Val Phe Asp Ala Thr Gly Ile Thr Thr Pro Glu Gly Leu Lys	
85 90 95 100	
ggg ctg tac gag ttc ttc acc cca ctg ctg cgc aac ctg ggt cac tgc	393
Gly Leu Tyr Glu Phe Phe Thr Pro Leu Leu Arg Asn Leu Gly His Cys	
105 110 115	
gcc cgc gtg gtg gtg gtc ggc acc acg ccc gac gcc gcc gcc ggc ccg	441
Ala Arg Val Val Val Val Gly Thr Thr Pro Asp Ala Ala Ala Gly Pro	
120 125 130	
cac gag cgg atc gcc cag cgc gcc ctg ga	